WATER RESEARCH

The Journal of the International Association on Water Pollution Research & Control

Contents, Author and Subject Index

VOLUME 23, 1989

PERGAMON PRESS OXFORD · NEW YORK
BEIJING · FRANKFURT · SÃO PAULO · SYDNEY · TOKYO · TORONTO

WR 23/12—J

WATER RESEARCH

Journal of the International Association on Water Pollution Research & Control

Instruction to Authors: instructions for the preparation and submission of manuscripts are given in the Notes for Contributors.

EDITORIAL OFFICE

IAWPRC
1 Queen Anne's Gate
London SW1H 9BT
U.K.

Tel: (44) 1-222-3848
Telex: 918518 WASSOC G
Fax: (44) 1-223-1197

Executive Director and Managing Editor
A. MILBURN*

Executive Editor
K. J. IVES*

Senior Editorial Assistant
W. A. HOROBIN

Editorial Assistant
K. DEAN

REGIONAL EDITORS

Dr H. R. Eisenhauer*
Conservation and Protection
Department of the Environment
Place Vincent Massey, Ottawa
Ontario, Canada K1A 0H3
Tel: (1) 819-994-5424
Telex: 053-4567
Fax: (1) 819-997-0547
Chairman of the Editorial Committee
Region covered: Canada

Professor T. Matsuo*
Department of Urban Engineering
University of Tokyo
7-3-1 Hongo, Bunkyo-ku
Tokyo 113, Japan
Tel: (81) 3-812-2111 Ext. 6244
Telex: 2722111 FEUT J
Fax: (81) 3-818-5946
Region covered: Japan and Western Pacific countries

Professor M. B. Pescod
University of Newcastle upon Tyne
Department of Civil Engineering
Claremont Road
Newcastle upon Tyne NE1 7RU, U.K.
Tel: (44) 91-232-8511
Telex: 53654 UNINEW G
Fax: (44) 91-2610191
Region covered: U.K. and developing countries

Mr G. Leynaud
CFRP
9 rue de Phalsbourg
75854 Paris Cedex 17, France
Tel: (33) 1-42-27-3891
Fax: (33) 1-43-80-6590
Region covered: France and all French-speaking areas

Professor M. Henze*
Department of Environmental Engineering
Technical University of Denmark
Building 115, DK-2800
Lyngby, Denmark
Tel: (45) 2-884200
Telex: 37529 DTHDIA DK
Fax: (45) 2-932860
Region covered: The Netherlands and Scandinavia

Dr F. G. Pohland
Department of Civil Engineering
University of Pittsburgh
Pittsburgh, PA 15261, U.S.A.
Tel: (1) 412-624-9870
Fax: (1) 412-624-1108
Region covered: U.S.A. and Latin America

Professor R. Kayser
Technische Universität Braunschweig
Postfach 3329
D-3300 Braunschweig, F.R.G.
Tel: (49) 531-391-2408
Telex: 952526 TUBSW
Fax: (49) 531-391-4577
Region covered: Germany and all German speaking areas

*Member of the Governing Board

GOVERNING BOARD: Chairman: P. Harremoës, Denmark, President IAWPRC; H. Arntsen, Argentina; **T. L. Judell, P. Michel,** Australia; **H. Kroiss,** Austria; **A. van Haute,** Belgium; **S. A. S. Almeida, R. G. Ludwig,** Brazil; **K. L. Murphy,** Canada; **G. Ruiz Troncoso,** Chile; **W. Baozhen,** China; **I. Hadjivassilis,** Cyprus; **P. Grau,** Czechoslovakia; **A. El-Dib, F. El-Gohary,** Egypt; **S. Mustonen,** Finland; **D. Ballay, J. Bernard, C. Gomella,** France; **K. R. Imhoff, G. Kugel, S. van Riesen,** Germany; **D. G. Christoulas,** Greece; **L. Somlyody,** Hungary; **B. B. Sundaresan,** India; **S. Soemarto,** Indonesia; **E. Balasha,** Israel; **A. di Pinto, L. Mendia,** Italy; **A. Hamada, I. Somiya,** Japan; **S.-P. Kwon,** Korea; **M. Y. Abdul Raheem,** Kuwait; **K. Kumarasivam,** Malaysia; **L. Lijklema, H. A. Meijer,** The Netherlands; **R. L. Earle,** New Zealand; **H. Odegaard,** Norway; **P. Almajose,** Philippines; **M. Gromiec,** Poland; **M. M. Pinto,** Portugal; **K. K. Chin,** Singapore; **P. G. J. Meiring, P. E. Odendaal, D. F. Toerien,** South Africa; **A. Hernandez,** Spain; **P. Balmer, A. G. Dahlberg,** Sweden; **W. Gujer, B. Jost,** Switzerland; **S. Dharmikarak,** Thailand; **D. Orhon,** Turkey; **T. A. Harker, D. H. Newsome, A. B. Wheatland,** U.K.; **A. Cutinella,** Uruguay; **R. A. Baker, T. M. Keinath, B. H. Olsen,** U.S.A.; **G. Rivas-Mijares,** Venezuela; **M. Miloradov,** Yugoslavia.

Application for membership of the *International Association on Water Pollution Research & Control* should be made to: Executive Director, *International Association on Water Pollution Research & Control*, 1 Queen Anne's Gate, London SW1H 9BT, England (*Tel.*: 01-222 3848; *Telex*: WASSOC G 918518).
Annual Membership Fees (1990): Corporate membership is £180.00 and is appropriate to firms, corporate bodies, including all profit-making organizations, departments of government and public administration. These members receive the monthly journals *Water Research* and *Water Science and Technology*. The fee for Individual Membership, which form of Membership is not available to any of the above organizations but is strictly reserved for employees, is £30.00. Individual Membership includes a subscription to the journal *Water Research*, or to the journal *Water Science and Technology*.

Publishing Office: Journals Production Unit, Pergamon Press plc, Hennock Road, Marsh Barton, Exeter, Devon EX2 8NE, England (*Tel.* Exeter (0392) 51558; *Telex* 42749).

Subscription and Advertising Offices: *North America*: Pergamon Press Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, USA: *Rest of the World*: Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, England (*Tel.* Oxford (0865) 64881).
Annual institutional subscription rate (1990) DM 1540.00; 2-year institutional rate (1990/91) DM 2926.00; personal subscription rate for those whose library subscribes at the regular rate (1990) DM 232.00. Prices are subject to amendment without notice.

Published Monthly. Copyright © 1989. Pergamon Press plc

Back Issues: Back issues of all previously published volumes, both in hard copy and in microform, are available direct from Pergamon Press offices.
It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A.: The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use: The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works or for resale. Specific written permission must be obtained from the publisher for such copying. *The Item-fee Code for this publication is*: 0043-1354/89 $3.00 + 0.00

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials, ANSI Z39.48-1984.

CONTENTS OF VOLUME 23

JANUARY

A. Hamm, J. Wieting, P. Schmitt and R. Lehmann — 1 — Documentation of areas potentially inclined to water acidification in the F.R.G.

W. M. Mok and C. M. Wai — 7 — Distribution and mobilization of arsenic species in the creeks around the Blackbird mining district, Idaho

Terry M. Williams and Richard F. Unz — 15 — The nutrition of *Thiothrix*, type 021N, *Beggiatoa* and *Leucothrix* strains

Toshio Ogiwara ✉ and Kiyoshi Kodaira — 23 — Measurement of copper complexing ability of the exudates of a *Microcystis*

M. Angelidis and R. J. Gibbs — 29 — Chemistry of metals in anaerobically treated sludges

William R. Knocke and Patti Trahern — 35 — Freeze–thaw conditioning of chemical and biological sludges

Yasunori Mahara and Hideo Matsuzuru — 43 — Mobile and immobile plutonium in a groundwater environment

Claustre Prat, Manuel Vicente and Santiago Esplugas — 51 — Ozonization of bleaching waters of the paper industry

Mª Carmen Rico, Luis Hernández, Mario Fernández, Mª José González and Milagros Montero — 57 — Organochlorine contamination in water of the Doñana National Park

G. Herman, A. Nishri and T. Berman — 61 — A long-term prediction model for total phosphorus concentrations in Lake Kinneret

Sang Eun Lee, Hang Sik Shin ✉ and Byeong Cheon Paik — 67 — Treatment of Cr(VI)-containing wastewater by addition of powdered activated carbon to the activated sludge process

Thomas H. Christensen and Xu Ze Lun — 73 — A method for determination of cadmium species in solid waste leachates

Xu Ze Lun and Thomas H. Christensen — 81 — Cadmium complexation by solid waste leachates

Anna Wolborska — 85 — Adsorption on activated carbon of *p*-nitrophenol from aqueous solution

Charles J. Moretti and Ronald D. Neufeld — 93 — PAH partitioning mechanisms with activated sludge

Yazmín A. Rojas and Terry C. Hazen — 103 — Survival of *Vibrio cholerae* in treated and untreated rum distillery effluents

Keith P. Hayes and Michael D. Burch — 115 — Odorous compounds associated with algal blooms in South Australian waters

O. S. Fatoki and F. Vernon — 123 — Determination of free fatty-acid content of polluted and unpolluted waters

Research Note

J. F. de L. G. Solbé and D. G. Shurben — 127 — Toxicity of ammonia to early life stages of rainbow trout (*Salmo gairdneri*)

FEBRUARY

iii — Notes for Contributors

131 — Editorial

Renate Walter, W. Macht, Jutta Dürkop, R. Hecht, U. Hornig and P. Schulze — 133 — Virus levels in river waters

Abraham Lerman and Werner Stumm	139	CO_2 storage and alkalinity trends in lakes
J. M. Dorioz, E. Pilleboue et A. Ferhi	147	Dynamique du phosphore dans les bassins versants: importance des phénomènes de rétention dans les sédiments
Steven J. Hamilton, Neil L. Faerber and Kevin J. Buhl	159	A system for reconstituting special water qualities for use in chronic toxicity studies
R. Gourdon, C. Comel, P. Vermande and J. Veron	167	Fractionation of the organic matter of a landfill leachate before and after aerobic or anaerobic biological treatment
Gheorghe Maria and Teodor Ognean	175	An adaptive parameter estimation used to obtain reduced kinetic models for the biological treatment process
K. T. Valsaraj and L. J. Thibodeaux	183	Relationships between micelle–water and octanol–water partition constants for hydrophobic organics of environmental interest
Darwin L. Sorensen, Steven G. Eberl and Robert A. Dicksa	191	*Clostridium perfringens* as a point source indicator in non-point polluted streams
R. D. MacNicol and P. H. T. Beckett	199	The distribution of heavy metals between the principal components of digested sewage sludge
Robert F. Hickey, Juliana Venderwielen and Michael S. Switzenbaum	207	The effect of heavy metals on methane production and hydrogen and carbon monoxide levels during batch anaerobic sludge digestion
Tohru Seiki, Hirofumi Izawa and Etsuji Date	219	Benthic nutrient remineralization and oxygen consumption in the coastal area of Hiroshima Bay
J. Zumstein and J. Buffle	229	Circulation of pedogenic and aquagenic organic matter in an eutrophic lake
P. Aarne Vesilind and C. James Martel	241	Thermal conductivity of sludges
Wolfgang Lietz and Gottfried Galling	247	Metals from sediments
A. Ratto, B. J. Dutka, C. Vega, C. Lopez and A. El-Shaarawi	253	Potable water safety assessed by coliphage and bacterial tests
Research Note		
M. Jensen and K. Krongaard Kristensen	257	Effects of rhodamine water tracer on *Escherichia coli* densities

MARCH

	iii	Notes for Contributors
G. I. McT. Cowan, E. M. Baggs and B. T. Hollohan	261	Bacteriological water quality of a multi-use catchment basin on the Avalon Peninsula, Newfoundland
U. K. Traegner and M. T. Suidan	267	Evaluation of surface and film diffusion coefficients for carbon adsorption
P. A. Cranwell and V. K. Koul	275	Sedimentary record of polycyclic aromatic and aliphatic hydrocarbons in the Windermere catchment
D. L. Lake, P. W. W. Kirk and J. N. Lester	285	Heavy metal solids association in sewage sludges
Janis Jansons, Lindsay W. Edmonds, Brent Speight and Marion R. Bucens	293	Movement of viruses after artificial recharge
Janis Jansons, Lindsay W. Edmonds, Brent Speight and Marion R. Bucens	301	Survival of viruses in groundwater
Mohamad R. Farvardin and Anthony G. Collins	307	Preozonation as an aid in the coagulation of humic substances—optimum preozonation dose
Robert G. Qualls, Mark H. Dorfman and J. Donald Johnson	317	Evaluation of the efficiency of ultraviolet disinfection systems
Lars Lövgren and Staffan Sjöberg	327	Equilibrium approaches to natural water systems—7. Complexation reactions of copper(II), cadmium(II) and mercury(II) with dissolved organic matter in a concentrated bog-water

D. Liu, Y. K. Chau and B. J. Dutka — 333 — Rapid toxicity assessment of water-soluble and water-insoluble chemicals using a modified agar plate method

J. H. M. Temmink, J. A. Field, J. C. van Haastrecht and R. C. M. Merkelbach — 341 — Acute and sub-acute toxicity of bark tannins in carp (*Cyprinus carpio* L.)

Charles N. Haas® — 345 — Analysis of disinfection data from dilution count experiments

Masanobu Ishikawa and Hajime Nishimura — 351 — Mathematical model of phosphate release rate from sediments considering the effect of dissolved oxygen in overlying water

T. Sekine, H. Tsugura, S. Urushibara, N. Furuya, E. Fujimoto and S. Matsui® — 361 — Evaluation of settleability of activated sludge using a sludge settling analyzer

J. Houston, B. N. Dancer and M. A. Learner — 369 — Control of sewage filter flies using *Bacillus thuringiensis* var. *israelensis* —I. Acute toxicity tests and pilot scale trial

J. Houston, B. N. Dancer and M. A. Learner — 379 — Control of sewage filter flies using *Bacillus thuringiensis* var. *israelensis* —II. Full scale trials

Technical Note
J. Houston, M. A. Learner and B. N. Dancer — 387 — Selection of an antibiotic-resistant strain of *Bacillus subtilis* var. *niger (B. globigii)* for use as a tracer in microbially rich waters

Forthcoming Conferences — 389

Erratum — 393

Acknowledgement to Referees — I

APRIL

iii — Notes for Contributors

C. C. Ho and Y. K. Tan — 395 — Comparison of chemical flocculation and dissolved air flotation of anaerobically treated palm oil mill effluent

Eugene B. Welch, Richard R. Horner and Clayton R. Patmont — 401 — Prediction of nuisance periphytic biomass: a management approach

Sharon M. Cline and Blaine F. Severin — 407 — Volatile organic losses from a composite water sampler

Steven K. Dentel, Angela V. Thomas and Kristine M. Kingery — 413 — Evaluation of the streaming current detector—I. Use in jar tests

Steven K. Dentel, Angela V. Thomas and Kristine M. Kingery — 423 — Evaluation of the streaming current detector—II. Continuous flow tests

G. Premazzi, G. Buonaccorsi and P. Zilio — 431 — Flow cytometry for algal studies

Michael D. Aitken,® Rajagopalan Venkatadri and Robert L. Irvine — 443 — Oxidation of phenolic pollutants by a lignin degrading enzyme from the white-rot fungus *Phanerochaete chrysosporium*

Sonia Ouldali, Roland Leduc and Van-Thanh-Van Nguyen — 451 — Uncertainty modeling of facultative aerated lagoon systems

M. Marchand, J. C. Caprais, P. Pignet et V. Porot — 461 — Les polluants organiques dans les effluents urbains et apports polluants dans le milieu marin. Cas du littoral français

Ronald D. Watt, Edwin J. Kirsch and C. P. Leslie Grady Jr — 471 — Ozone consumption kinetics in filtered activated sludge effluents: a modified approach

Tore Lindholm, John E. Eriksson® and Jussi A. O. Meriluoto — 481 — Toxic cyanobacteria and water quality problems—examples from a eutrophic lake on Åland, south west Finland

Alfred P. Benoist and Lambertus Lijklema — 487 — A methodology for the assessment of frequency distributions of combined sewer overflow volumes

Renate Kühn, Monika Pattard, Klaus-Dieter Pernak and Angela Winter — 495 — Results of the harmful effects of selected water pollutants (anilines, phenols, aliphatic compounds) to *Daphnia magna*

RENATE KÜHN, MONIKA PATTARD, KLAUS-DIETER PERNAK and ANGELA WINTER — 501 Results of the harmful effects of water pollutants to *Daphnia magna* in the 21 day reproduction test

R. M. REES, F. PARKER-JERVIS and M. S. CRESSER — 511 Soil effects on water chemistry in three adjacent upland streams at Glendye in northeast Scotland

Research Notes

EILEEN M. BURKE, F. XAVIER SUAREZ, DANIEL C. HILLMAN and EDWARD M. HEITHMAR — 519 The evaluation and comparison of ion chromatography, segmented flow analysis and flow injection analysis for the determination on nitrate in natural surface waters

M. FIELDING and J. HALEY — 523 Aqueous chlorination of permethrin

P. D. CAPEL, TH. LICHTENSTEIGER and P. H. BRUNNER — 525 The use of sludge-only landfills as historical records of persistent organic chemicals and heavy metals in sewage sludge

TAIZO TSUDA, SHIGERU AOKI, MIHOKO KOJIMA and HIROYUKI HARADA — 529 Bioconcentration and excretion of benthiocarb and simetryne by carp

Corrigendum — 533

Erratum — 534

MAY

iii Notes for Contributors

MARGARITA WINTER and REINHOLD KICKUTH — 535 Elimination of sulphur compounds from wastewater by the Root Zone process—I. Performance of a large-scale purification plant at a textile finishing industry

MARGARITA WINTER and REINHOLD KICKUTH — 547 Elimination of sulphur compounds from wastewater by the Root Zone process—II. Mode of formation of sulphur deposits

M. TSEZOS and J. P. BELL — 561 Comparison of the biosorption and desorption of hazardous organic pollutants by live and dead biomass

J. MARTINEZ, J. VIVES-REGO and J. SANCHEZ-LEAL — 569 The effect of chemical structure and molecular weight of commercial alkylbenzenes on the toxic response of *Daphnia* and naturally occurring bacteria in fresh and seawater

D. COUILLARD, S. GARIÉPY and F. T. TRAN — 573 Slaughterhouse effluent treatment by thermophilic aerobic process

D. S. BHARGAVA and C. S. P. OJHA — 581 Theoretical analysis of backwash time in rapid sand filters

CHRISTOPH MUNZ and PAUL V. ROBERTS ✉ — 589 Gas- and liquid-phase mass transfer resistances of organic compounds during mechanical surface aeration

JOHN B. MAHONEY — 603 Algal assay of relative abundance of phytoplankton nutrients in northeast United States coastal and shelf waters

U. M. COWGILL, D. P. MILAZZO and B. D. LANDENBERGER — 617 A comparison of the effect of Triclopyr triethylamine salt on two species of duckweed (*Lemna*) examined for a 7 and 14-day test period

C. POLPRASERT ✉ and K. CHARNPRATHEEP — 625 Heavy metal removal in attached-growth waste stabilization ponds

D. M. GORDON and A. J. MCCOMB — 633 Growth and production of the green alga *Cladophora montagneana* in a eutrophic Australian estuary and its interpretation using a computer program

HASAN ALI SAN — 647 A kinetic model for ideal plug-flow reactors

G. D. FITZMAURICE and N. F. GRAY ✉ — 655 Evaluation of manufactured inocula for use in the BOD test

AHMED Y. ALI-MOHAMED and SADIQ G. A. JAMALI — 659 Potentiometric determination of fluoride and iodide in natural and processed waters of Bahrain using ion-selective electrodes

Research Note
C. MEYNARD, J. P. REYS, R. PHAN-TAN-LUU and G. DUMENIL — 663 Bacteriological monitoring of seawater: correlation between fecal and total coliforms and interpretation of the results according to the present standards

JUNE

iii Notes for Contributors

CHRISTOPHER I. RIDLEY-THOMAS, ALAN AUSTIN, WM. P. LUCEY and M. J. R. CLARK — 667 Variability in the determination of ash free dry weight for periphyton communities: a call for a standard method

K. V. ELLIS and H. B. R. J. VAN VREE — 671 Iodine used as a water-disinfectant in turbid waters

H. FURUMAI Ⓜ and S. OHGAKI Ⓜ — 677 Adsorption–desorption of phosphorus by lake sediments under anaerobic conditions

H. FURUMAI Ⓜ, T. KONDO and S. OHGAKI Ⓜ — 685 Phosphorus exchange kinetics and exchangeable phosphorus forms in sediments

R. GOOSSENS, A. DELVILLE, J. GENOT, R. HALLEUX and W. J. MASSCHELEIN — 693 Removal of the typical isotopes of the Chernobyl fall-out by conventional water treatment

MARCO SCHINTU Ⓜ, TIIT KAURI and AKIRA KUDO Ⓜ — 699 Inorganic and methyl mercury in inland waters

EMMA ORIVE Ⓜ, ANA BASAGUREN, BEGOÑA G. DE BIKUÑA and MARIA CACHO — 705 A comparative study of water mineralization and nutrient status in the main water courses of Biscay (Basque Country)

JOSEF VESELÝ, PETR BENEŠ and KAREL ŠEVČÍK — 711 Occurrence and speciation of beryllium in acidified freshwaters

B. TELTSCH, I. BEN-HARIM, J. EREN and H. LEVENTER — 719 Short term effects of nutrient enrichment on the quality of irrigation water

I. FOX, M. A. MALATI and R. PERRY — 725 The adsorption and release of phosphate from sediments of a river receiving sewage effluent

J. S. BURGER, W. O. K. GRABOW Ⓜ and R. KFIR — 733 Detection of endotoxins in reclaimed and conventionally treated drinking water

TOYOAKI AOKI and KOUJI KAWAKAMI — 739 Continuous flow method for determination of total trihalomethanes in drinking water with membrane-separation

K. ZIOGOU, P. W. W. KIRK and J. N. LESTER Ⓜ — 743 Behaviour of phthalic acid esters during batch anaerobic digestion of sludge

M. S. HOLT, E. MATTHIJS and J. WATERS — 749 The concentrations and fate of linear alkylbenzene sulphonate in sludge amended soils

M. I. YAZIZ, H. GUNTING, N. SAPARI and A. W. GHAZALI — 761 Variations in rainwater quality from roof catchments

J. M. P. VIEIRA Ⓜ and L. LIJKLEMA Ⓜ — 767 Development and application of a model for regional water quality management

R. F. MCCURDY, R. BOSS and J. DALE — 779 Determination of ammonia in water by centrifugal analysis

WANG YU Ⓜ and XU BIN-WEN — 785 New method of design of steam-distillation treatment of wastewater

Forthcoming Conferences — 791

JULY

iii Notes for Contributors

HAMANTH C. KASAN and ALBIN A. W. BAECKER — 795 An assessment of toxic metal biosorption by activated sludge from the treatment of coal-gasification effluent of a petrochemical plant

J. M. QUIROGA, D. SALES and A. GÓMEZ-PARRA — 801 Experimental evaluation of pollution potential of anionic surfactants in the marine environment

Shaukat Farooq and Mansoor Ahmed	809	Modeling of an ozone–wastewater system's kinetics
J. P. Baudin and A. F. Fritsch	817	Relative contributions of food and water in the accumulation of ^{60}Co by a freshwater fish
J. M. Quinn and P. N. McFarlane	825	Epilithon and dissolved oxygen depletion in the Manawatu River, New Zealand: simple models and management implications
K. J. Reddy and V. R. Hasfurther	833	Solubility and release of fluorine and molybdenum from oil shale solid wastes
M. T. Suidan Ⓜ, Y. T. Wang and B. R. Kim Ⓜ	837	Performance evaluation of biofilm reactors using graphical techniques
E. Matthijs, N. T. de Oude, M. Bolte and J. Lemaire	845	Photodegradation of ferric ethylenediaminetetra(methylenephosphonic acid) (EDTMP) in aqueous solution
Cornelis A. Horduk, Johannes J. M. van Engelen, Frank A. Jonker and Thomas E. Cappenberg	853	Determination of total sulfur in freshwater sediments by ion chromatography
K. J. Ives	861	Filtration studied with endoscopes
Niels Peter Revsbech, Peter Bondo Christensen, Lars Peter Nielsen and Jan Sørensen	867	Denitrification in a trickling filter biofilm studied by a microsensor for oxygen and nitrous oxide
Mogens Madsen and Joergen Schlundt	873	Low technology water purification by bentonite clay flocculation as performed in Sudanese villages: bacteriological examinations
J. Wanner Ⓜ and P. Grau Ⓜ	883	Identification of filamentous microorganisms from activated sludge: a compromise between wishes, needs and possibilities
G. Persoone Ⓜ and J. Castritsi-Catharios	893	A simple bioassay with *Artemia* larvae to determine the acute toxicity of antifouling paints
H. S. Rathore and H. A. Khan	899	A novel method for the detection and semiquantitative determination of trace levels of 2,4-D and related compounds
J. L. Stauber and T. M. Florence	907	The effect of culture medium on metal toxicity to the marine diatom *Nitzschia closterium* and the freshwater green alga *Chlorella pyrenoidosa*
H. R. Rogers, J. A. Campbell, B. Crathorne and A. J. Dobbs	913	The occurrence of chlorobenzenes and permethrins in twelve U.K. sewage sludges
Susan Rivera, Tomás Lugo and Terry C. Hazen	923	Autecology of *Vibrio vulnificus* and *Vibrio parahaemolyticus* in tropical waters
Technical Note Issei Kasahara, Tetsuji Ogawa, Noriko Hata, Shigeru Taguchi, Katsumi Goto Ⓜ, Masaaki Ohta and Kunio Ohzeki	933	Selective and sensitive spectrophotometric determination of copper in water after collection of its Bathocuproine complex on an organic-solvent-soluble membrane filter

AUGUST

	iii	Notes for Contributors
Marta Korczak and Jerzy Kurbiel	937	New mineral–carbon sorbent: mechanism and effectiveness of sorption
T. Taylor Eighmy and Paul L. Bishop	947	Distribution and role of bacterial nitrifying populations in nitrogen removal in aquatic treatment systems
G-Y. Rhee, B. Bush, M. P. Brown, M. Kane and L. Shane	957	Anaerobic biodegradation of polychlorinated biphenyls in Hudson River sediments and dredged sediments in clay encapsulation
William F. A. Duncan, Merlyn A. Brusven and Theodore C. Bjornn	965	Energy-flow response models for evaluation of altered riparian vegetation in three southeast Alaskan streams
A. Sarkar and R. Sen Gupta	975	Determination of organochlorine pesticides in Indian coastal water using a moored *in-situ* sampler

K. Himberg, A.-M. Keijola, L. Hiisvirta, H. Pyysalo and K. Sivonen — 979 The effect of water treatment processes on the removal of hepatotoxins from *Microcystis* and *Oscillatoria* cyanobacteria: a laboratory study

Michael D. Cailas and Ronald Gehr — 985 The oxygen uptake rate approach for analysing respirometric biochemical oxygen demand data—I. Method development

Michael D. Cailas and Ronald Gehr — 993 The oxygen uptake rate approach for analysing respirometric biochemical oxygen demand data—II. Application and evaluation

Ulku Yetis and Celal F. Gokcay — 1003 Effect of nickel(II) on activated sludge

Raymond P. Canale and Steven W. Effler — 1009 Stochastic phosphorous model for Onondaga Lake

Gordon R. Finch and Daniel W. Smith — 1017 Ozone dose–response of *Escherichia coli* in activated sludge effluent

Brian O'Keefe and John Green — 1027 Coliphages as indicators of faecal pollution at three recreational beaches on the Firth of Forth

H. B. Pionke and D. E. Glotfelty — 1031 Nature and extent of groundwater contamination by pesticides in an agricultural watershed

Robert E. Palmer, Ronald J. Klauda, Michael A. Jepson and Elgin S. Perry — 1039 Acute sensitivity of early life stages of fathead minnow (*Pimephales promelas*) to acid and aluminum

A. Bousher, P. Brimblecombe and D. Midgley — 1049 Kinetics of reactions in solutions containing monochloramine and bromide

W. D. Emmerson — 1059 The nutrient status of the Sundays River estuary South Africa

Technical Note
Wilson F. Jardim and Jarbas J. R. Rohwedder — 1069 Chemical Oxygen Demand (COD) using microwave digestion

SEPTEMBER

iii Notes for Contributors

L. Larrea, C. F. Forster and D. Melé — 1073 Changes in lignin during diffused air activated sludge treatment of Kraft effluents

Per Larsson and Kerstin Lemkemeier — 1081 Microbial mineralization of chlorinated phenols and biphenyls in sediment–water systems from humic and clear-water lakes

Phillip R. Cosser — 1087 Water quality, sediments and the macroinvertebrate community of residential canal estates in south-east Queensland, Australia: a multivariate analysis

Mahmood Y. Ali and J. P. Riley — 1099 The production of brominated methanes in desalination plants in Kuwait

S. R. Rippey and V. J. Cabelli — 1107 Use of the thermotolerant *Aeromonas* group for the trophic state classification of freshwaters

Stefan Löfgren and Bengt Boström — 1115 Interstitial water concentrations of phosphorus, iron and manganese in a shallow, eutrophic Swedish lake—implications for phosphorus cycling

C. Benamou, M. Richou et J. Benaim — 1127 Importance relative des bio- et des géopolymères dans les eaux interstitielles: utilisation de la spectrofluorimétrie et essais biochimiques

E. Rakotonarivo, C. Tondre, J. Y. Bottero et J. Malleviale — 1137 Complexation de l'aluminium(III) polymérise et hydrolyse par les ions salicylate. Etude cinétique et thermodynamique

M. F. Hamoda — 1147 Kinetic analysis of aerated submerged fixed-film (ASFF) bioreactors

M. Divizia, P. de Filippis, A. Di Napoli, A. Venuti, R. Perez-Bercoff and A. Panà — 1155 Isolation of wild-type hepatitis A virus from the environment

S. K. Srivastava, Renu Tyagi and Nalini Pant — 1161 Adsorption of heavy metal ions on carbonaceous material developed from the waste slurry generated in local fertilizer plants

John J. Gannon and Michael K. Busse 1167 *E. coli* and enterococci levels in urban stormwater, river water and chlorinated treatment plant effluent

W. E. Hill, L. D. Benefield Ⓜ and S. R. Jing 1177 ^{31}P-NMR spectroscopy characterization of polyphosphates in activated sludge exhibiting enhanced phosphorus removal

B. Baleux and M. Troussellier 1183 Optimization of a sampling design and significance of bacterial indicators: application to the bacteriological survey of the Ardèche river, France

F. Ventura Ⓜ, J. Caixach, A. Figueras, I. Espalder, D. Fraisse and J. Rivera 1191 Identification of surfactants in water by FAB mass spectrometry

Forthcoming Conferences 1205

OCTOBER

iii Notes for Contributors

Betty H. Olson Ⓜ, John N. Lester Ⓜ, Sandy M. Cayless and Simon Ford 1209 Distribution of mercury resistance determinants in bacterial communities of river sediments

Tero P. Myllyvirta and Pekka J. Vuorinen 1219 Avoidance of bleached kraft mill effluent by pre-exposed *Coregonus albula* L.

Kurt W. Pontasch, Eric P. Smith and John Cairns Jr 1229 Diversity indices, community comparison indices and canonical discriminant analysis: interpreting the results of multispecies toxicity tests

J. L. Sotelo, F. J. Beltrán, F. J. Benitez and J. Beltrán-Heredia 1239 Henry's law constant for the ozone–water system

C. H. van der Weijden and J. J. Middelburg 1247 Hydrogeochemistry of the River Rhine: long term and seasonal variability, elemental budgets, base levels and pollution

J. M. Quinn and P. N. McFarlane 1267 Effects of slaughterhouse and dairy factory wastewaters on epilithon: a comparison in laboratory streams

Jerry L. Farris, Scott E. Belanger, Donald S. Cherry and John Cairns Jr 1275 Cellulolytic activity as a novel approach to assess long-term zinc stress to *Corbicula*

Tomio Suzuki and Gentaro Yamaura 1285 Natural recovery of chemical components accumulated in soil by wastewater application

Irene A. Watson-Craik and Eric Senior 1293 Treatment of phenolic wastewaters by co-disposal with refuse

John S. Gifford Ⓜ, Dennis B. George Ⓜ and V. Dean Adams Ⓜ 1305 Synergistic effects of potassium permanganate and PAC in direct filtration systems for THM precursor removal

E. van der Wende, W. G. Characklis Ⓜ and D. B. Smith 1313 Biofilms and bacterial drinking water quality

Research Note

Peter M. Schafer and Mike Moser 1323 Sterilization method determines effect of toxic foam plug on algal cultures

Technical Notes

Yoram Avnimelech 1327 Modelling the accumulation of organic matter in the sediments of a newly constructed reservoir

C. Jordan 1331 The mean pH of mixed fresh waters

NOVEMBER

iii Notes for Contributors

Antonio Lallai and Giampaolo Mura 1335 pH variation during phenol biodegradation in mixed cultures of microorganisms

Michael Neill 1339 Nitrate concentrations in river waters in the south-east of Ireland and their relationship with agricultural practice

Vera Istvánovics, Sándor Herodek and Ferenc Szilágyi 1357 Phosphate adsorption by different sediment fractions in Lake Balaton and its protecting reservoirs

C. Corless, G. Reynolds, N. Graham, R. Perry, T. M. Gibson and J. Haley — 1367 — Aqueous ozonation of a quaternary ammonium surfactant

S. H. Eberle — 1373 — A correctness test of the computation of chemical speciation for the main constituents of natural waters

Oussama Turk and Donald S. Mavinic — 1383 — Maintaining nitrite build-up in a system acclimated to free ammonia

Gülerman Sürücü and F. Dilek Çetin — 1389 — Effect of temperature, pH and DO concentration on filterability and compressibility of activated sludge

K. J. Kennedy, S. S. Gorur, C. A. Elliott, E. Andras and S. R. Guiot — 1397 — Media effects on performance of anaerobic hybrid reactors

Ofra Adam and Yehuda Kott — 1407 — Evaluation of water quality as measured by bacterial maximum growth rate

S. Vigneswaran and Jing Song Chang — 1413 — Experimental testing of mathematical models describing the entire cycle of filtration

Derin Orhon, Ilhan Talinli and Olcay Tünay — 1423 — The fate of 2,4-D in microbial cultures

J. Chudoba, J. Alboková and J. S. Čech — 1431 — Determination of kinetic constants of activated sludge microorganisms responsible for degradation of xenobiotics

J. Chudoba, J. Alboková, B. Lentge and R. Kümmel — 1439 — Biodegradation of 2,4-dichlorophenol by activated sludge micro-organisms

Ross D. Markwell, Des W. Connell and Albert J. Gabric — 1443 — Bioaccumulation of lipophilic compounds from sediments by oligochaetes

Dag Hongve — 1451 — Anion exchange for removal of humus from drinking water: calcium improves the efficiency of the process

Lawrence C. C. Koe and F. G. Ang — 1455 — Biocatalytic addition: does it aid anaerobic digestion?

Technical Note
R. N. Vaidya and V. G. Pangarkar — 1461 — Predicting mass transfer rates in RBC for non-Newtonian fluids

Erratum — 1465

DECEMBER

iii — Notes for Contributors

J. Keck, R. C. Sims, M. Coover, K. Park and B. Symons — 1467 — Evidence for cooxidation of polynuclear aromatic hydrocarbons in soil

Ute Skiba and Malcolm Cresser — 1477 — Prediction of long-term effects of rainwater acidity on peat and associated drainage water chemistry in upland areas

R. A. Barbosa and G. L. Sant'Anna Jr — 1483 — Treatment of raw domestic sewage in an UASB reactor

Byung R. Kim and Makram T. Suidan — 1491 — Approximate algebraic solution for a biofilm model with the Monod kinetic expression

J. L. Alonso, E. Garay and E. Hernandez — 1499 — Membrane filter procedure for enumeration of *Pseudomonas aeruginosa* in water

Richard L. Ward, Douglas R. Knowlton, Judy Stober, Walter Jakubowski, Tammy Mills, Parrie Graham and David E. Camann — 1503 — Effect of wastewater spray irrigation on rotavirus infection rates in an exposed population

D. Orhon, S. Soybay, O. Tünay and N. Artan — 1511 — The effect of reactor hydraulics on the performance of activated sludge systems—I. The traditional modelling approach

N. Artan and D. Orhon — 1519 — The effect of reactor hydraulics on the performance of activated sludge systems—II. The formation of microbial products

S. W. Park and C. P. Huang — 1527 — Chemical substitution reaction between Cu(II) and Hg(II) and hydrous CdS(s)

Nandan Padukone and Graham F. Andrews — 1535 — A simple, conceptual mathematical model for the activated sludge process and its variants

Marta Plavšić and Božena Ćosovic Ⓜ — 1545 — The effect of surface active substances on the electrochemical behaviour of copper ions in chloride solutions and in natural waters

Ben Koopman, Charles M. Stevens, Charles L. Logue, Patrick Karney and Gabriel Bitton — 1555 — Automatic sampling equipment and BOD test nitrification

Anthony J. Paulson, Mark M. Benjamin Ⓜ and John F. Ferguson — 1563 — Zn solubility in low carbonate solutions

Michael J. McFarland Ⓜ and William J. Jewell Ⓜ — 1571 — *In situ* control of sulfide emissions during the thermophilic (55°C) anaerobic digestion process

Gudrun Abbt-Braun, Fritz H. Frimmel Ⓜ and Hans-Rolf Schulten — 1579 — Structural investigations of aquatic humic substances by pyrolysis-field ionization mass spectrometry and pyrolysis-gas chromatography/mass spectrometry

J. Naumczyk, L. Szpyrkowicz and F. Zilio Grandi Ⓜ — 1593 — Organics isolation from fresh and drinking waters by macroporous anion-exchange resins

Research Note

A. Grobicki and D. C. Stuckey — 1599 — The role of formate in the anaerobic baffled reactor

Forthcoming Conferences — 1603